

Grade 9 Academic Math
Unit 0 – Measurement and Geometry Review – Major Test

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Victim: Mr. Solutions

Mr. S. has done it again!!

KU	APP	TIPS	COM
10/10	18/18	12/12	10/10

Modified True or False (5 KU)Indicate whether each statement is **true** or **false**. If false, **change** the underlined part to make the statement true.

1. F Math is like a dating service because it's all about relativism. *Change: relationships*
2. F If the side length of a square is tripled, its area is tripled. *e.g. $A=1 \times 1 = 1$, $A=3 \times 3 = 9$. Change: multiplied by 9*
3. F A square pyramid has five **lateral** faces. *Change: four*
4. F The basic elements of math are objections, operations and relationships. *Change: objects*
5. F $\frac{(A_{\text{base}})(\text{height})}{3}$ is the volume of any cone or cylinder. *Change: pyramid*

Multiple Choice (5 KU)

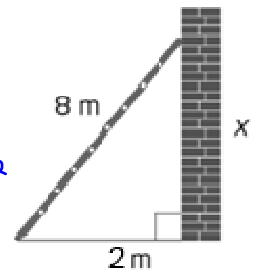
For questions 6 to 10, select the best answer. Write the letter of your choice in the provided blank space.

6. C A cone has a **volume** of 314.16 cm³ and a **height** of 5 cm. To one decimal place, **what is its radius**?

~~(a) 60.0 cm~~ ~~(b) 20.0 cm~~ (c) 7.7 cm ~~(d) 12.0 cm~~
Too large!! $\frac{1}{3}\pi r^2 h = \frac{1}{3}\pi (7.7)^2 (5) \div 310 \text{ cm}^3$

7. C A window cleaner has placed an 8-m ladder against a wall. The bottom of the ladder is 2 m away from the wall. **How high is the top of the ladder, to the nearest tenth of a metre, above the ground?**

~~(a) 60.0 m~~ (b) 6 m (c) 7.7 m ~~(d) 10 m~~
 $7.7^2 + 2^2 = 63.29$
 $8^2 = 64$



8. b A circular swimming pool has a **diameter** of 20 m. When filled completely the pool holds exactly **100,000 L of water**. To one decimal place, **what is the height of the pool?**

~~(a) 318.3 m~~ ~~(b) 3.2 m~~ (c) 0.3 m ~~(d) 79.6 m~~ (Hint: 1000 L = 1 m³)
 $\pi r^2 h = \pi (10)^2 h = 100\pi h = 100$
 $\therefore \pi h = 1 \therefore h = \frac{1}{\pi} \div 0.3$ *(100,000 L = 100 m³)*



9. C Which statement is **not** true?

(a) The sum of the interior angles of a pentagon is 3(180°).
 (b) The sum of the interior angles of a triangle is 180°.
(c) The sum of the exterior angles of a triangle is 180°.
 (d) The sum of the exterior angles of a convex polygon is 360°.

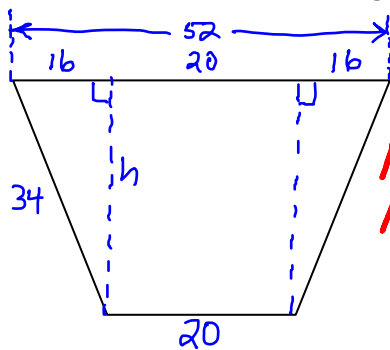
10. d When a transversal intersects a pair of parallel lines, which of the following is true?

(a) Co-interior angles are supplementary.
 (b) Corresponding angles are equal.
 (c) Alternate angles are equal.
(d) All of the above.

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Full Solutions/Explanations

11. Sam and Dhanila have a kite-making business that competes with Vyshna's and Uday's VUiTon Fashionable Kites. Their company is called FUNky Kites because they specialize in oddly-shaped kites. The shape of one of their funkiest kites is shown at the right. **How much material** would be needed to make one of these kites? (6 APP)



MEANS
AREA !!

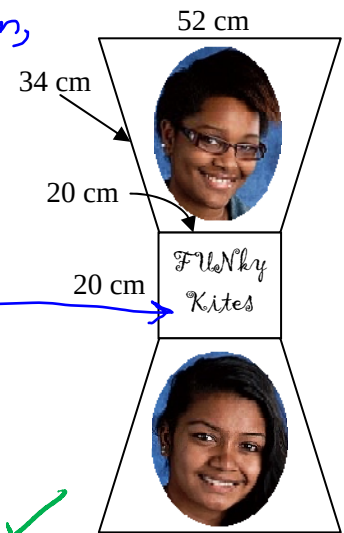
By the Pythagorean Theorem,

$$\begin{aligned} h^2 + 16^2 &= 34^2 \\ h^2 &= 34^2 - 16^2 \\ h^2 &= 900 \\ h &= \sqrt{900} = 30 \end{aligned}$$

$$\begin{aligned} A_{\text{Trapezoid}} &= \frac{h(a+b)}{2} \\ &= \frac{30(52+20)}{2} \\ &= 1080 \text{ cm}^2 \end{aligned}$$

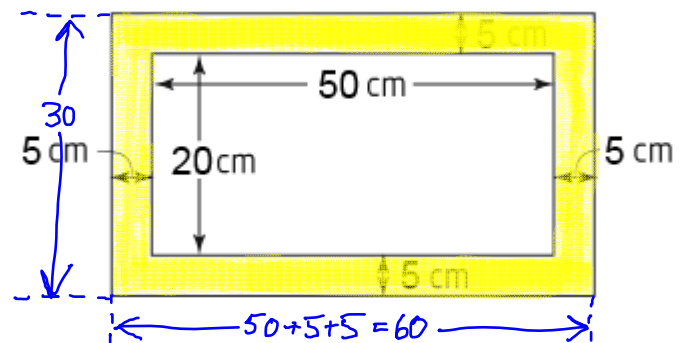
$$\begin{aligned} A_{\text{square}} &= lw \\ &= 20(20) \\ &= 400 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} \therefore A_{\text{kite}} &= 2A_{\text{Trapezoid}} + A_{\text{square}} \\ &= 2(1080) + 400 \\ &= 2560 \text{ cm}^2 \end{aligned}$$



12. A picture measures 50 cm by 20 cm. The mat around the picture is 5 cm wide. Find the area of the mat. (4 APP)

$$\begin{aligned} A_{\text{mat}} &= A_{\text{large rectangle}} - A_{\text{picture}} \\ &= 60(30) - 50(20) \\ &= 1800 - 1000 \\ &= 800 \text{ cm}^2 \end{aligned}$$



The mat around the picture has an area of 800 cm².

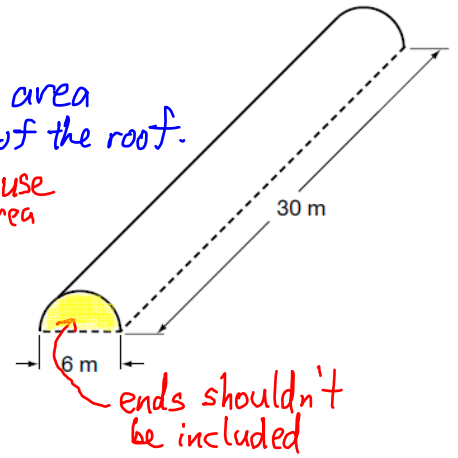
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13. The figure shows a greenhouse roof that is shaped like a half-cylinder.

What is the surface area of the roof? (Don't include the ends.) (4 APP)

The "ends" should not be included in the surface area because vertical surfaces are not considered part of the roof.

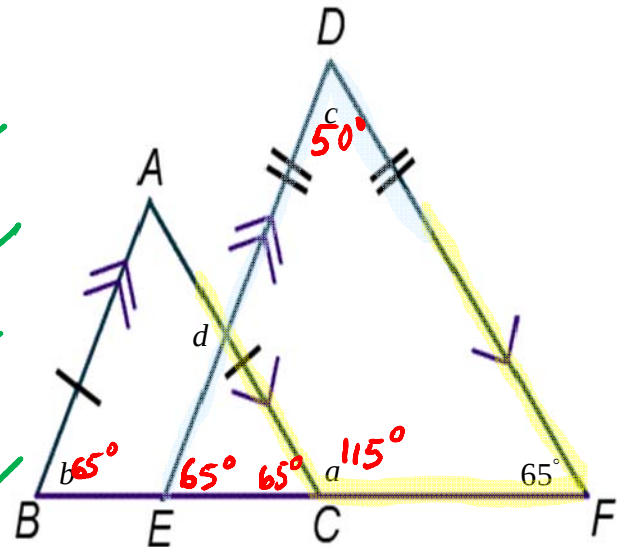
$$\begin{aligned} \therefore A_{\text{roof}} &= \frac{2\pi rh}{2} \quad \text{+ } 2\pi r^2 \text{ not included because this term represents the area of the circular base and top} \\ &= \pi rh \quad \div 2 \text{ because this is a half-cylinder} \\ &= 3.14(3)(30) \\ &= 282.6 \text{ m}^2 \end{aligned}$$



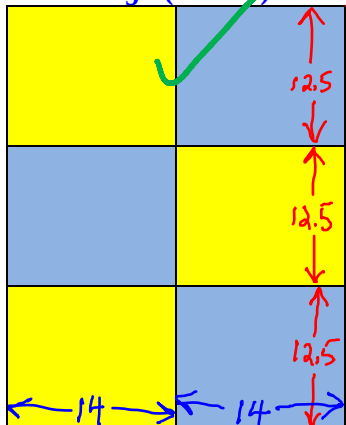
The surface area of the roof is about 282.6 m^2 .

14. Find the measures of each angle labelled with a letter. In each case, state your reasoning. (4 APP)

Measure of Angle	Reasoning (State Why)
$a = 115^\circ$	$a + 65^\circ = 180^\circ$
$b = 65^\circ$	$\angle DEF = 65^\circ$ because $\triangle DEF$ is isosceles $\therefore b = 65^\circ$
$c = 50^\circ$	Sum of interior angles of $\triangle$ must be 180° . $\therefore c + 65^\circ + 65^\circ = 180^\circ$
$d = 130^\circ$	$\angle ACE = 180^\circ - 115^\circ = 65^\circ$ (supp. $\angle$'s) $\therefore d = 65^\circ + 65^\circ$ (exterior angle of $\triangle$)



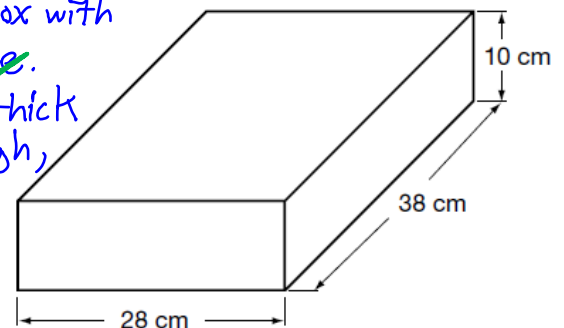
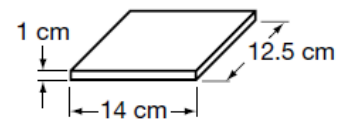
15. Elisa wants to pack CD cases into a storage box. What is the largest number of CD cases that she can pack inside the box? Explain your reasoning. (6 TIPS)



① Six CDs can be arranged as shown in the diagram and just fit inside the box with very little room to spare.

② Since the CDs are 1 cm thick and the box is 10 cm high, 10 such layers can be stacked up in the box.

③ Therefore, the box should be able to hold about $10(6) = 60$ CDs.



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16. Andy's Pizza has two special pizza deals in honour of crazy celebrities. The Lady Gaga Saucy Special Pizza has an area of 1000 cm^2 and sells for \$19.50. The Miley Cyrus Spicy Twerking Pizza has a radius 1.5 times that of the Lady Gaga Pizza. **How much should Andy charge for the Miley Cyrus Pizza? (6 TIPS)**

Given Information

$$A_{\text{Gaga}} = 1000 \text{ cm}^2$$

$$C_{\text{Gaga}} = \$19.50$$

$$r_{\text{Miley}} = 1.5 r_{\text{Gaga}}$$



Since $A_{\text{Gaga}} = 1000$

$$\therefore \pi r_{\text{Gaga}}^2 = 1000 \checkmark$$

$$\therefore r_{\text{Gaga}}^2 = \frac{1000}{\pi}$$

$$\therefore r_{\text{Gaga}} = \sqrt{\frac{1000}{\pi}} \approx 17.84 \checkmark$$

$$\therefore r_{\text{Miley}} \approx 1.5(17.84) = 26.76 \checkmark$$

$$\therefore A_{\text{Miley}} \approx \pi (26.76)^2 = 2250 \text{ cm}^2 \checkmark$$

$$\therefore \frac{A_{\text{Miley}}}{A_{\text{Gaga}}} \approx \frac{2250}{1000} = 2.25 \checkmark$$

This means that the Miley pizza is about 2.25 times larger than the Gaga pizza.

Accordingly, the Miley pizza should be 2.25 times as expensive.

Therefore, the Miley pizza should cost about

$$2.25(\$19.50) = \$43.88$$



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